

Patent Claims:

1-31 Canceled

32. (New) An electronic control system for a vehicle,
comprising a driver request module for determining characteristic quantities with respect to the driver's request from data at least representative of pedal travels, movements of the foot changing between the pedals and the brake pressure of the brake system, and

a risk calculator for determining risk potentials from predefined and current vehicle data and additional data, the risk calculator performing at least an assessment of the condition of danger of the vehicle and the occupants in the vehicle and, in case of need, outputs controlling interventions graded according to the risk potential for controlling actuators, and

an arbitration unit for receiving outputs from the risk calculator and performing an assessment with the data determined in the driver request module with regard to the characteristic quantities determined in the driver request module depending on an action influencing the driving dynamics of the vehicle brought about by the controlling interventions and, depending on the result of the assessment, releasing the graded controlling interventions to a limited extent, releasing them in their entirety, or blocking them.

33. (New) The electronic control system as claimed in claim 32,
wherein the driver request module is capable of determining a repositioning movement of the driver's foot between an accelerator pedal and a brake pedal from accelerator pedal travel information and brake light information as input quantities.

34. (New) The electronic control system as claimed in claim 33,
wherein the driver request module is capable of determining the time of repositioning the foot between the pedals from the input quantities.

35. (New) The electronic control system as claimed in claim 32,
wherein the driver request module (29) is capable of supplying the characteristic quantities determined to the subsequent arbitration unit.

36. (New) The electronic control system as claimed in claim 35,
wherein the driver request module is capable of supplying further
characteristic quantities to the subsequent arbitration unit (28).
37. (New) The electronic control system as claimed in claim 32,
wherein the risk calculator is capable of calculating risk potentials from data
relating to at least the vehicle longitudinal speed, the vehicle longitudinal
acceleration, the vehicle lateral acceleration, the distances from relevant objects
and state data about driving dynamics controllers, said risk potentials, at least in
dependence on determined dynamics risk characteristic quantities, producing
controller outputs graded in their effect and dependent on the determined risk
potential for applying brakes, for adjusting reversible occupant protection means
and for adjusting devices that change the relative position between occupant
protection means and vehicle occupants.
38. (New) The electronic control system as claimed in claim 32,
wherein the risk calculator (10) calculates risk potentials from data
representing at least the vehicle longitudinal speed, the vehicle longitudinal
acceleration and the vehicle lateral acceleration, and at least one of the following
quantities: the distance from relevant objects in the local area, the distance from
relevant objects in at least one remote area, a derivative of at least one of the
afore-mentioned quantities and state data about at least one driving dynamics
controller; said risk potentials, at least in dependence on determined dynamical-
risk characteristic quantities, producing controller outputs for closing vehicle
openings.
39. (New) The electronic control system as claimed in claim 32,
wherein, depending on the risk potential determined, the risk calculator (10)
further generates signals to warn the driver of the vehicle or to guide the driver to
a reaction that is adapted to the current vehicle situation and passes on these
signals directly to the actuators (18, 16) for realization.
40. (New) The electronic control system as claimed in claim 39,
wherein the warnings are given by means of a vehicle part that is in contact

with a body part of the driver.

41. (New) The electronic control system as claimed in claim 39,
wherein the directions are given by means of a modified control force on at least a pedal or the steering wheel.
42. (New) The electronic control system as claimed in claim 32,
wherein the risk calculator (10) calculates risk potentials from data representing at least the vehicle longitudinal speed, the vehicle longitudinal acceleration and the vehicle lateral acceleration, and at least one of the following quantities: the distance from relevant objects in the local area, the distance from relevant objects in at least one remote area, a derivative of at least one of the afore-mentioned quantities and state data about at least one driving dynamics controller; said risk potentials, at least in dependence on dynamical-risk characteristic quantities, producing information for a non-reversible occupant protection means and for the control systems of the non-reversible occupant protection means.
43. (New) The electronic control system as claimed in claim 32,
wherein the risk calculator determines different risk potentials and combines them for producing the controlling interventions.
44. (New) The electronic control system as claimed in claim 32,
wherein the risk calculator determines risk potentials by way of a fuzzy system and/or in a driving-dynamics model.
45. (New) The electronic control system as claimed in claim 32,
wherein the risk calculator determines risk potentials by way in a driving-dynamics model.
46. (New) The electronic control system as claimed in claim 43,
wherein the risk calculator determines general risk potentials and special risk potentials, with the general risk potentials being actuator-independent and the special risk potentials being actuator-dependent.

47. (New) The electronic control system as claimed claim 32,
wherein the arbitration unit includes a state machine which arbitrates the characteristic quantities provided by the driver request module (29) including at least one of the following quantities: brake pedal travel, brake pedal speed, accelerator pedal travel, accelerator pedal speed, the time of repositioning the foot between the accelerator pedal and the brake pedal, the condition (on/off) of a brake light, measured brake pressures of the brake system, calculated brake pressures of the brake system, the acceleration of the vehicle, the risk potentials determined by the risk calculator, and derivatives of the aforementioned quantities, with respect to the braking interventions determined by the risk calculator.

48. (New) The electronic control system as claimed in claim 47,
wherein the arbitration unit determines a braking intervention depending on the characteristic quantities accelerator pedal travel, brake pedal travel and at least one of the following quantities: brake pressures, brake pressure changes, acceleration, brake light information of the driver request module representative of the driver's request, and wherein the arbitration unit derives levels for maximum decelerations according to threshold values of these characteristic quantities and the risk potentials.

49. (New) The electronic control system as claimed in claim 48,
wherein arbitration unit establishes a characteristic factor defining the degree of the braking request of the driver depending on the weighting of the following conditions:

- a) ratio of the brake pedal travel to the maximum of the brake pedal travel,
- b) ratio of brake pedal speed to the maximum of the brake pedal speed;
- c) factor assessing the time of repositioning the foot from the accelerator pedal to the brake pedal.

50. (New) The electronic control system as claimed in claim 48,
wherein arbitration unit establishes a characteristic factor defining the degree of the braking request of the driver depending on the weighting of the

following conditions:

- a) ratio of a brake pressure requested by the driver to the average maximum of an emergency brake pressure;
- b) ratio of the time gradient of the brake pressure requested by the driver to the average time gradient of a maximum of an emergency brake pressure;
- c) factor assessing the time of repositioning the foot from the accelerator pedal to the brake pedal.

51. (New) The electronic control system as claimed in claim 48,
Wherein the arbitration unit determines an emergency brake situation from the time variation of the brake pressure and the brake light information and the time variation of the risk potential.
52. (New) The electronic control system as claimed in claim 51,
wherein when the emergency brake situation is detected, the deceleration calculated by the risk calculator is conducted entirely as a nominal value to the brake actuators.
53. (New) An arbitration unit for an electronic control system of a vehicle,
wherein it is connected to a risk calculator (10) and a driver request module and arbitrates characteristic quantities supplied by the driver request module (29) with respect to controlling interventions determined by the risk calculator.
54. (New) The arbitration unit as claimed in claim 53,
including a state machine.
55. (New) A risk calculator for an electronic control system of a vehicle,
comprising a model for calculating actuator-specific and actuator-unspecific risk potentials from quantities which are supplied by devices of the vehicle.
56. (New) The risk calculator as claimed in claim 55,
wherein the devices of the vehicle are area sensors, driving-dynamics sensors, travel sensors, pressure sensors, and devices performing model calculations.

57. (New) An electronic control system for a vehicle,
comprising a signal conditioning device (21), a risk calculator (10), a driver
request module (29), and an arbitration unit (28).

58. (New) A method for determining at least one driver-independent
intervention into a vehicle system, including the steps of

Determining a driver's request in a driver request module including
characteristic quantities with respect to the driver's request, from data being at
least representative of pedal travels, movements of a foot changing between
pedals, and brake pressure of a brake system,

Determining a risk potential in a risk calculator from predefined and current
vehicle data and additional data, including ambience data and driver data, and
optionally data of persons inside and outside the vehicle,

performing at least an assessment of the condition of danger of the vehicle
and the occupants of the vehicle within the risk calculator,

depending on the assessment and on further criteria, supplying outputs
controlling interventions graded according to the risk potential to an arbitration unit
for the purpose of controlling actuators, and

performing an assessment in said arbitration unit with the data determined
in the driver request module with regard to the driver' request depending on an
action influencing the driving dynamics of the vehicle brought about by the
controlling interventions, and

initiating, from the arbitration unit, graded controlling interventions to a
limited extent, releasing them without limitation or completely blocking them
depending on the result of the assessment.

59. (New) A method for determining risk potentials for a vehicle control system,
including the step of determining, based on a model, actuator-independent
and actuator-dependent risk potentials from input and output quantities of the
vehicle.